

# Python For Data Science Cheat Sheet

## Seaborn

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### Statistical Data Visualization With Seaborn

The Python visualization library **Seaborn** is based on **matplotlib** and provides a high-level interface for drawing attractive statistical graphics.

Make use of the following aliases to import the libraries:

```
>>> import matplotlib.pyplot as plt
>>> import seaborn as sns
```

The basic steps to creating plots with Seaborn are:

1. Prepare some data
2. Control figure aesthetics
3. Plot with Seaborn
4. Further customize your plot

```
>>> import matplotlib.pyplot as plt
>>> import seaborn as sns
>>> tips = sns.load_dataset("tips")
>>> sns.set_style("whitegrid")           Step 1
>>> g = sns.lmplot(x="tip",
>                  y="total_bill",
>                  data=tips,
>                  aspect=2)                      Step 2
>>> g.set_axis_labels("Tip", "Total bill(USD)") . Step 3
>>> set(xlim=(0,10), ylim=(0,100))
>>> plt.title("title")                Step 4
>>> plt.show(g)                      Step 5
```

## 1 Data

Also see [Lists, NumPy & Pandas](#)

```
>>> import pandas as pd
>>> import numpy as np
>>> uniform_data = np.random.rand(10, 12)
>>> data = pd.DataFrame({'x':np.arange(1,101),
>                      'y':np.random.normal(0,4,100)})
```

Seaborn also offers built-in data sets:

```
>>> titanic = sns.load_dataset("titanic")
>>> iris = sns.load_dataset("iris")
```

## 2 Figure Aesthetics

### Seaborn styles

```
>>> sns.set()                         (Re)set the seaborn default
>>> sns.set_style("whitegrid")          Set the matplotlib parameters
>>> sns.set_style("ticks",
>                 {"xtick.major.size":8,
>                  "ytick.major.size":8})      Set the matplotlib parameters
>>> sns.axes_style("whitegrid")        Return a dict of params or use with
>                                         to temporarily set the style
```

## 3 Plotting With Seaborn

### Axis Grids

```
>>> g = sns.FacetGrid(titanic,
>                     col="survived",
>                     row="sex")
>>> g.map(plt.hist, "age")
>>> sns.factorplot(x="pclass",
>                   y="survived",
>                   hue="sex",
>                   data=titanic)
>>> sns.lmplot(x="sepal_width",
>              y="sepal_length",
>              hue="species",
>              data=iris)
```

Subplot grid for plotting conditional relationships

Draw a categorical plot onto a Facetgrid

Plot data and regression model fits across a FacetGrid

```
>>> h = sns.PairGrid(iris)
>>> h = h.map(plt.scatter)
>>> sns.pairplot(iris)
>>> i = sns.JointGrid(x="x",
>                     y="y",
>                     data=data)
>>> i = i.plot(sns.regplot,
>                      sns.distplot)
>>> sns.jointplot("sepal_length",
>                  "sepal_width",
>                  data=iris,
>                  kind='kde')
```

Subplot grid for plotting pairwise relationships  
Plot pairwise bivariate distributions  
Grid for bivariate plot with marginal univariate plots

Plot bivariate distribution

### Categorical Plots

#### Scatterplot

```
>>> sns.stripplot(x="species",
>                  y="petal_length",
>                  data=iris)
>>> sns.swarmplot(x="species",
>                  y="petal_length",
>                  data=iris)
```

#### Bar Chart

```
>>> sns.barplot(x="sex",
>                 y="survived",
>                 hue="class",
>                 data=titanic)
```

#### Count Plot

```
>>> sns.countplot(x="deck",
>                  data=titanic,
>                  palette="Greens_d")
```

#### Point Plot

```
>>> sns.pointplot(x="class",
>                  y="survived",
>                  hue="sex",
>                  data=titanic,
>                  palette={"male":"g",
>                           "female":"m"},
>                  markers=["^", "o"],
>                  linestyles=["-", "--"])
```

#### Boxplot

```
>>> sns.boxplot(x="alive",
>                 y="age",
>                 hue="adult_male",
>                 data=titanic)
```

#### Violinplot

```
>>> sns.violinplot(x="age",
>                   y="sex",
>                   hue="survived",
>                   data=titanic)
```

Scatterplot with one categorical variable

Categorical scatterplot with non-overlapping points

Show point estimates and confidence intervals with scatterplot glyphs

Show count of observations

Show point estimates and confidence intervals as rectangular bars

#### Boxplot

Boxplot with wide-form data

#### Violin plot

### Regression Plots

```
>>> sns.regplot(x="sepal_width",
>                 y="sepal_length",
>                 data=iris,
>                 ax=ax)
```

Plot data and a linear regression model fit

### Distribution Plots

```
>>> plot = sns.distplot(data.y,
>                       kde=False,
>                       color="b")
```

Plot univariate distribution

### Matrix Plots

```
>>> sns.heatmap(uniform_data, vmin=0, vmax=1)
```

Heatmap

## 4 Further Customizations

Also see [Matplotlib](#)

### Axisgrid Objects

```
>>> g.despine(left=True)
>>> g.set_ylabels("Survived")
>>> g.set_xticklabels(rotation=45)
>>> g.set_axis_labels("Survived",
>                     "Sex")
>>> h.set(xlim=(0,5),
>         ylim=(0,5),
>         xticks=[0,2.5,5],
>         yticks=[0,2.5,5])
```

Remove left spine  
Set the labels of the y-axis  
Set the tick labels for x  
Set the axis labels

Set the limit and ticks of the x-and y-axis

### Plot

```
>>> plt.title("A Title")
>>> plt.ylabel("Survived")
>>> plt.xlabel("Sex")
>>> plt.ylim(0,100)
>>> plt.xlim(0,10)
>>> plt.setp(ax, yticks=[0,5])
>>> plt.tight_layout()
```

Add plot title  
Adjust the label of the y-axis  
Adjust the label of the x-axis  
Adjust the limits of the y-axis  
Adjust the limits of the x-axis  
Adjust a plot property  
Adjust subplot params

## 5 Show or Save Plot

Also see [Matplotlib](#)

```
>>> plt.show()
>>> plt.savefig("foo.png")
>>> plt.savefig("foo.png",
>               transparent=True)
```

Show the plot  
Save the plot as a figure  
Save transparent figure

### Close & Clear

```
>>> plt.cla()
>>> plt.clf()
>>> plt.close()
```

Clear an axis  
Clear an entire figure  
Close a window

